Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A ~~computer tomography~~ method, comprising~~having the following steps~~:

generating ~~a) generation by~~ a radiation beam that traverses an examination region and a subject therein~~source of a beam bundle passing through a periodically moving object,~~;

rotating the radiation source around the examination region about ~~b) generation of a relative movement between the beam source on the one hand and the object on the other hand, which comprises a rotation about~~ an axis of rotation;

detecting radiation that traverses the examination region and at least a heart of the subject therein and generating image data indicative thereof;~~c) acquisition by means of a detector unit, during the relative movement, of measured values that are dependent on the intensity in the beam bundle on the other side of the object, an acquisition time being allocated to each measured value and to the beam causing the respective measured value,~~

detecting an EKG signal, which includes a plurality of the heart cycles, for the subject;~~d) detection of a movement signal depending on the movement of the object by means of a movement detection device and determination of periods of the periodic movement by means of the detected movement signal,~~

correlating the EKG signal with the image data;

identifying a first plurality of time periods in a first heart cycle of the EKG signal;

identifying a second plurality of time periods in a second heart cycle of the EKG signal;

selecting first image data for one of the time periods of the first heart cycle;

selecting second image data for one of the time periods of the second heart cycle, wherein the first and second image data correspond to a same overlapping sub-region of the heart and a similarity measure applied to reconstructed intermediate images generated therefrom is minimized; and

reconstructing an image based on the first and second image data.

~~e) reconstruction of a computer tomography image of the object from the measured values, wherein only measured values whose acquisition times lie within the periods in time intervals are used, which are so determined that a similarity measure applied to intermediate images of a same subregion of the object is minimized, wherein different intermediate images are reconstructed using measured values from time intervals from different periods.~~

2. (Currently amended) The ~~A computer tomography~~ method as claimed in claim 1, ~~wherein in step e) initially in each case a time interval having a pre-determinable interval width is arranged at a pre-determinable~~ interval position ~~in each period, in that each period forms a respective period pair with a chronologically immediately preceding period and a chronologically immediately following period, and in that for each period pair the~~ following ~~steps are carried out:~~

~~i) determination of a subregion of the object, which is traversed both by beams whose acquisition instants lie in the time interval of the one period and by beams whose acquisition instants lie in the time interval of the other period,~~

wherein the selected one of the time periods of the first heart cycle is a first predetermined time period having a predetermined location within the first heart cycle and the selected one of the time periods of the second heart cycle is a second predetermined time period having a predetermined location within the second heart cycle and the predetermined width; and

further including:

i) generating ~~ii) generation of~~ a first intermediate image based on image data from the first predetermined time period~~by reconstruction of the subregion exclusively using measured values whose acquisition instants lie in the time interval of the one period,~~;

ii) generating ~~iii) generation of~~ a second ~~further~~ intermediate image based on image data from the second predetermined time period~~by reconstruction of the subregion exclusively using measured values whose acquisition instants lie in the time interval of the other period,~~;

iii) determining ~~iv) determination of~~ a similarity value indicative of ~~by applying~~ a similarity between ~~measure to~~ the first and second ~~the further~~ intermediate images;; and

iv) ~~v)~~ modifying the ~~interval~~ width and/or the location of the second predetermined time period within the second heart cycle if the similarity value does not satisfy a predetermined criterion~~interval position of the time interval of the other period, and.~~

~~repetition of the steps iii) to v) until a break-off criterion dependent on the similarity value is satisfied.~~

3. (Currently amended) The ~~A computer tomography~~ method as claimed in claim 2, further including repeating ii) to iv) until the similarity value satisfies the predetermined criterion~~wherein chronologically consecutive period pairs are taken into consideration in succession in accordance with steps i) to v)~~.

4. (Currently amended) The ~~A computer tomography~~ method as claimed in claim 2, wherein the ~~break-off criterion in step v) leads to a termination when the~~ predetermined criterion is satisfied when the similarity value falls below a predetermined similarity threshold.

5. (Currently amended) The ~~A computer tomography~~ method as claimed in claim 1, wherein determining the ~~application of the~~ similarity value includes~~measure to two intermediate images of the same subregion comprises the following~~ steps:

~~———~~dividing ~~division of~~ the subregion into several subdivision regions;;

~~———~~subtracting ~~subtraction of~~ an image value of a subdivision region from the one intermediate image from an image value of the same subdivision region from the other intermediate image for each subdivision region to form a respective absolute difference; and;

~~———~~summing~~summation of~~ the absolute differences to generate ; ~~wherein the~~ resulting ~~sum is~~ the similarity value ~~of the similarity measure~~.

6. (Currently amended) The~~A computer tomography~~ method as claimed in claim 1, wherein reconstructing the images includes reconstructing the images using a weighted reconstruction algorithm~~measured values whose acquisition instants lie in a time interval are weighted before the reconstruction of the intermediate images and the CT image with a weighting that decreases in size the further away from the middle of a time intervals the acquisition instant of a measured value lies~~.

7. (Currently amended) The~~A computer tomography~~ method as claimed in claim 1, wherein reconstructing the images includes reconstructing the ~~reconstruction of the intermediate~~ images via ~~and/or the CT image is effected with a~~ filtered back-projection.

8. (Currently amended) The~~A computer tomography~~ method as claimed in claim 1, wherein the intermediate images are reconstructed with a lower spatial resolution than the ~~CT~~ image.

9. (Cancelled)

10. (Currently amended) The~~A computer tomography~~ method as claimed in claim 1[[9]], wherein a heart cycle spans ~~period determined in step d) corresponds to the distance of time between~~ two adjacent R-peaks of the ~~electrocardiogram~~EKG signal.

11. (Currently amended) A computer tomograph ~~for carrying out the method as claimed in claim 1, having,~~ comprising:

a radiation source that generates ~~a~~ radiation beam that traverses an examination region and at least a heart of a subject ~~source for generating a beam bundle passing through a periodically moving object~~therein, wherein the radiation source rotates around the examination region about

~~a drive arrangement for generating a relative movement between the beam source on the one hand and the object on the other hand, which comprises a rotation about~~ an axis of rotation;,

~~———~~a detector unit that detects radiation traversing the examination region and generates projection data indicative thereof~~for acquiring measured values that depend on the intensity in the beam bundle on the other side of the object, during the relative movement, wherein an acquisition instant is allocated to each measured value and to the beam causing the respective measured value,~~;

~~———~~an electrocardiograph ~~movement detecting device~~ that generates an EKG signal including a plurality of the heart cycles for the subject ~~for detecting periods of the periodic movement by means of a movement signal depending on the movement of the object,~~;

~~———~~a reconstruction unit that reconstructs ~~for reconstruction of a computer tomography~~ an image of the subject~~object from the~~ with first and second sub-sets of projection data from two different heart cycles~~measured values,~~; wherein the sub-sets correspond to a same overlapping sub-region of the heart and a similarity measure applied to reconstructed intermediate images generated therefrom is minimized.

~~———a control unit for controlling the beam source, the drive arrangement, the detector unit, the movement detection device and the reconstruction unit in accordance with the following steps:~~

~~———a) generation by a beam source of a beam bundle passing through a periodically moving object,~~

~~———b) generation of a relative movement between the beam source on the one hand and the object on the other hand, which comprises a rotation about an axis of rotation,~~

~~———c) acquisition by means of a detector unit, during the relative movement, of measured values that are dependent on the intensity in the beam bundle on the other side of the object, an acquisition time being allocated to each measured value and to the beam causing the respective measured value,~~

~~———d) detection of a movement signal depending on the movement of the object by means of a movement detection device and determination of periods of the periodic movement by means of the detected movement signal,~~

~~———e) reconstruction of a computer tomography image of the object from the measured values, wherein only measured values whose acquisition times lie within the periods in time intervals are used, which are so determined that a similarity measure applied to intermediate~~

~~images of a same subregion of the object is minimized, wherein different intermediate images are reconstructed using measured values from time intervals from different periods.~~

12. (Currently amended) A computer readable storage medium encoded with instructions that when executed by a computer cause the computer to perform ~~to control a beam source, a drive device, a detector unit, a movement detection device and a reconstruction unit of a computer tomograph for implementing~~ the method as claimed in claim 1.

13. (Cancelled)

14. (Currently amended) The method of claim 1, wherein ~~each~~ the intermediate images ~~is~~ respectively are reconstructed with image data exclusively ~~only~~ from a single heart cycle~~time interval within a corresponding different one of the periods in time~~.

15. (Cancelled)

16. (Currently amended) The method of claim 2, wherein the modification ~~to the time interval of the other period~~ reduces motion between the ~~first~~ intermediate images relative to a motion prior to the modification~~, which is reconstructed exclusively using measured values from the one period, and the second intermediate image, which is reconstructed exclusively using measured values from the other time period, wherein the one and the other periods represent different R-R periods~~.

17. (Previously presented) The method of claim 5, wherein a first of the two intermediate images is reconstructed with data only from one of the different periods and a second of the two intermediate images is reconstructed with data only from the other of the different periods.

18 (Currently Amended) The method ~~computer tomography~~ of claim 5, wherein each region corresponds to a different voxel.

19-20. (Cancelled)

21. (New) The method of claim 1, further comprising:

identifying a third plurality of time periods in a third heart cycle of the EKG signal;

selecting third image data for one of the time periods of the third heart cycle, wherein a similarity measure applied to reconstructed intermediate images generated with the second and the third image data is minimized; and

reconstructing an image based on the first, second and third image data.

22. (New) The method of claim 11, wherein the reconstruction unit reconstructs the image with three or more sub-sets of projection data respectively from three or more different heart cycles, and a similarity measure applied to intermediate images reconstructed with the three or more sub-sets of projection data is minimized.

23. (New) The method of claim 11, wherein a location of a reconstruction window of the second sub-set of projection data within a second heart cycle of the different heart cycles is changed prior to reconstruction based on the similarity measure.

24. (New) The method of claim 11, wherein a width of a reconstruction window for the second sub-set of projection data is changed prior to reconstruction based on the similarity measure.

25. (New) A computer tomography method having the following steps:

a) generation by a beam source of a beam bundle passing through a periodically moving object;

b) generation of a relative movement between the beam source on the one hand and the object on the other hand, which comprises a rotation about an axis of rotation;

c) acquisition by means of a detector unit, during the relative movement, of measured values that are dependent on the intensity in the beam bundle on the other side of the

object, an acquisition time being allocated to each measured value and to the beam causing the respective measured value;

d) detection of a movement signal depending on the movement of the object by means of a movement-detection device and determination of periods of the periodic movement by means of the detected movement signal;

e) reconstruction of a computer tomography image of the object from the measured values, wherein only measured values whose acquisition times lie within the periods in time intervals are used, which are so determined that a similarity measure applied to intermediate images of a same subregion of the object is minimized, wherein different intermediate images are reconstructed using measured values from time intervals from different periods;

wherein initially in each case a time interval having a pre-determinable interval width is arranged at a pre-determinable interval position in each period, in that each period forms a respective period pair with a chronologically immediately preceding period and a chronologically immediately following period, and in that for each period pair the following steps are carried out:

i) determination of a subregion of the object, which is traversed both by beams whose acquisition instants lie in the time interval of the one period and by beams whose acquisition instants lie in the time interval of the other period;

ii) generation of a first intermediate image by reconstruction of the subregion exclusively using measured values whose acquisition instants lie in the time interval of the one period;

iii) generation of a further intermediate image by reconstruction of the subregion exclusively using measured values whose acquisition instants lie in the time interval of the other period;

iv) determination of a similarity value by applying a similarity measure to the first and the further intermediate image; and

v) modifying the interval width and/or the interval position of the time interval of the other period, and repetition of the steps iii) to v) until a break-off criterion dependent on the similarity value is satisfied.